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## India

## Planting Seeds

## Annual

## 2002

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### Report Highlights:

**India's Plant Varieties Protection Legislation is in place, thus fulfilling one of its WTO/TRIPS obligations. With the commercial release of Monsanto's Bt cotton, India has entered the GMO era.**

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Includes PSD changes: No  
Includes Trade Matrix: No  
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## **Production**

The Indian seeds market is one of the world's largest, supplied almost exclusively by locally produced seeds. Farmers retain seed of major food and commercial crops for many years, and the largest volume of seed trade involves local exchanges of established self-pollinating varieties. The use of hybrid seeds is still very low, but awareness about the high yield and quality of the produce from hybrid seeds, attracting them to switch over to new varieties of hybrids, is growing. The farmers' acceptance of modern farming technologies and use of hybrid seeds in several regions is a positive indication of the growth of seed industry.

Government efforts have focused on developing superior cultivars of major food and fiber crops, with utilization of seed lines obtained from Consultative Group on International Agricultural Research (CGIAR) institutions modified at state universities and government research institutes. Public sector companies (13 State Seed Corporations and the National Seed Corporation) are the major supplier of seeds, primarily of cereals, pulse, and oilseeds. They distributed 850,00 tons of certified/improved seeds in 2000/01, of which rice and wheat account for almost 60 percent.

In recent years, private sector seed companies have begun playing an important role, most of which are regional and focus on a specific product group. Private seed companies numbering around 150, including a few multinationals, tend to focus on low volume high value crops with major emphasis on hybrids of corn, sunflower, cotton and vegetables. According to a recent study by a private organization, the composition of the seed industry, by volume of turnover, has reached a ratio of 60:40 between the private and public sectors. The private seed sector currently is undergoing significant change, with several small/medium companies merging with multinationals due to the high cost of research and development. Foreign companies are targeting Indian seed companies for outright takeovers, for marketing alliances or contract production.

## **Plant Health Regulations**

Imports of seeds and planting materials are permitted in accordance with the provisions of Plants, Fruits and Seeds (Regulation of Imports into India) Order, 1989. An import permit and phytosanitary certificates with additional declarations, if necessary, as prescribed by the Plant Protection Advisor to the Government of India, is required. After arrival of the imported seeds, quarantine checks are undertaken, which may include visual inspection, laboratory inspection, and grow-out tests. If samples drawn from an imported consignment pass the prescribed checks, they are released for entry.

## **Seed Certification**

Under the Indian Seed Act of 1966, seed certification is voluntary. The Seed Act allows the sale of "truthfully labeled" seeds, which permit private seed companies to market their seeds under a brand name without going through the process of seed certification. However, the GOI is proposing to amend the existing Seed Act, which would entail compulsory registration of any seed or planting material, domestic or imported, that are placed in the market for sale with the National Seeds Board, to

be constituted by the government. Registration for new varieties will be granted on the basis of multi-locational trials over a minimum period of three seasons. Imports for sale of seeds will be permitted only for registered varieties. However, imports of seeds of unregistered varieties in small quantities will be permitted for research and trial. For vegetable and ornamental crops a simple system of varietal registration based on "breeder declaration" will be sufficient. Anyone who imports seeds or planting material will declare whether such material is a product of transgenic manipulation or involves Genetic Use of Restriction Technology.

### **Intellectual Property Rights**

After a prolonged debate and several modifications, The Protection of Plant Varieties and Farmers' Rights Legislation was enacted by the Parliament in August last year and received the assent of the President of India on October 30, 2001. Thus India now fulfills one of its WTO obligations relating to Trade Related Intellectual Property Rights (TRIPS). The legislation will come into force from the date of notification by the GOI. The objective of the legislation is to provide an effective system for the Protection of Plant Varieties and Farmers' Rights, which will stimulate investment for research and development both in the public and private sectors for development of new plant varieties by insuring appropriate return on such investment. However, the legislation retains several of the contentious issues such as compulsory acquisition of parental material of a variety and granting production licence to a third party to produce proprietary variety when there is a shortage of such seeds. Nevertheless, the legislation is believed to be in conformity with the International Union for Protection of New Varieties of Plants (UPOV) Convention of 1978. The Indian Cabinet has recently approved India's accession to UPOV.

The legislation recognizes the role of farmers as cultivators and conservers and the contribution of traditional, rural, and tribal communities to the country's agro-bio diversity and proposes to reward them for their contribution through benefit sharing and protecting the traditional rights of farmers. The Act has a provision to set up a Protection of Plant Varieties & Farmers' Rights Authority to perform all functions related to the protection of plant varieties. Under the new legislation, farmers will continue to enjoy their traditional right to save, use, exchange, share, and sell the produce of the protected variety with the only restriction that the farmer will not be able to sell branded seed of the protected variety for commercial purposes. The GOI will set up the Plant Varieties and Farmers' Rights Protection Authority, which will be vested with necessary executive powers to perform all functions relating to the protection of plant varieties.

India's Agriculture Minister Ajit Singh signed the International Treaty on Plant Genetic Resources for Food and Agriculture at Rome on June 11, 2002. This has paved the way for India to formally ratify the treaty. India had played a significant role in formulating this treaty.

### **Biotechnology**

There is a general recognition within India's scientific community, and even within the government, that biotechnology offers the only realistic means to achieving food security.

According to the GOI's recently released National Seed Policy (see <http://agricoop.nic.in/seedpolicy.htm>) " Biotechnology will play a vital role in the development of the agriculture sector. The technology can be used not only to develop new crops/varieties, which are tolerant to diseases, pests, and abiotic stresses, but also improve productivity and nutritional quality of food."

The Indian government supports transgenic crop research and the use of approved genetically modified seeds. To promote biotechnology research, a National Biotechnology Board was constituted in 1982; it later became the Department of Biotechnology (DBT) under the Ministry of Science and Technology. The DBT has overall responsibility for coordinating bio-tech research, extension and administration. It also oversees biotechnology research in agriculture, animal science, industry, medicine, aquaculture and other areas. Various research institutes and agricultural universities under the Indian Council of Agricultural Research (ICAR), and several other universities and institutes are also involved in agri-biotechnology under the overall supervision of DBT. Several private sector companies, by themselves or with foreign partners, also are doing work in biotechnology.

With the exception of Monsanto's Bt cotton (see **IN2023 India Enters GMO Era**), no genetically modified (GMO) varieties of crops have been "officially" released. Work is underway with cotton, rapeseed/mustard, tomatoes, chickpeas, peas, rice, wheat, cabbage, cauliflower, chilli, peanut, etc. According to a Vision Paper prepared by DBT, transgenic of these crops would complete field assessment and some of them would be ready for large scale production by 2005. According to knowledgeable sources, release of any Indian biotech varieties by the government research institutes is at least five years away. However, the GEAC is considering the commercial release of a genetically modified rapeseed variety developed by a private company.

All genetically engineered crops/varieties will be tested for environment and bio-safety before their commercial release, as per regulations and guidelines of the Environment Protection Act, 1986 (EPA). Biosafety guidelines and regulations are formulated by DBT in exercise of the powers conferred to it through **"Rules for the manufacture, use, import, export and storage of hazardous micro organisms genetically engineered organisms or cells"** formulated under the **Environment Protection Act, 1986** and issued by the Ministry of Environment and Forests on December 5, 1989. (See <http://envfor.nic.in> and <http://dbtindia.nic.in>). These rules are to be implemented through the following authorities:

**a. Recombinant DNA Advisory Committee (RDAC)**

Reviews biotechnology developments at national and international levels and recommends suitable and appropriate safety regulations in recombinant research, use and application.

**b. Review Committee on Genetic Manipulation (RCGM)**

Monitors safety related aspects of ongoing research projects and activities involving genetically engineered organisms/hazardous micro organisms.

**c. Institutional Bio Safety Committees (IBSC)**

Monitors research activities at the institutional level. All of the institutions and industries engaged in genetic engineering activities have IBSCs.

**d. The Genetic Engineering Approval Committee (GEAC)**

Determines large scale use of GMOs at the commercial level and open field trials of transgenic materials including agricultural crops, industrial products, health care products, etc.

**e. State Biotechnology Coordination Committee (SBCC)**

Inspects and takes punitive action in cases of violations of statutory provision.

**f. District Level Committee (DLC)**

Monitors safety regulations in installations engaged in the use of genetically modified organisms/hazardous microorganisms and their application in the environment.

The DBT is actively implementing the EPA rules and regulations through IBSC, RCG, and GEAC. DBT has also prepared the Recombinant DNA Safety Guidelines and is also finalizing the guidelines on "Research in Transgenic Plants".

**Trade**

Although India is not a large seed trader, volume has grown since implementation of the 1988 Policy on Seed Development. Imports are mostly confined to vegetable, flower, and fruit seeds for which no import restrictions exist. Total imports during 2000/01 (Apr-Mar), the latest year for which data are available, were 801 tons valued at \$13.9 million, compared with 760 tons valued at \$13.6 million in 1999/00. The US, with a market share of 14 percent (\$ 2 million), slumped to third position after South Korea and Netherlands from its top position in 1999/00.

India also exports seeds (mostly vegetable seed), which are mainly custom grown by foreign seed companies for export to third country markets. Varied agro-climatic conditions and cheap labor make India a favored country for custom growing of seeds. Exports during 2000/01 were 9,295 tons valued at \$13.8 million, compared with 5,417 tons valued at \$18.4 million in 1999/00. The US is the largest export market for Indian seeds (mostly tomato and other vegetable), with a market share of 20 percent (\$2.7 million).

**Table 1 - India: Seed Imports 2000/01 (Apr-Mar)**

		Quantity	Value
		Kg	\$
12091100	Sugar beet	30	41
	France	30	41
12091900	Other beet	9,874	91,797
	USA	9,874	91,797
12092200	Clover	0	0
12092900	Other forage	0	0
12093000	Herbaceous Plants	28,305	413,294
	Australia	1	312
	Denmark	800	6,632
	France	504	32,819
	Germany	2,546	7,743
	Japan	69	11,060
	Korea RP	135	13,018
	Mexico	1,012	39,815
	Netherlands	20,818	211,234
	UK	549	19,756
	USA	1,871	70,904
12099101	Cabbage	109,538	4,839,408
	Australia	4,085	208,463
	Taipei	204	26,360
	China	669	48,506
	Denmark	15,228	103,054
	France	2,271	100,781
	Germany	1,302	25,967
	Iceland	706	147,677
	Israel	292	6,622
	Italy	11,942	145,322
	Japan	22,605	1,652,679
	Korea DP RP	500	52,450
	Korea RP	10,937	1,238,972
	Netherlands	31,000	767,514
	Spain	50	5,789
	Sri Lanka	150	1,119

	Thailand	340	29,646
	USA	7,257	278,488
12099102	Cauliflower	28,114	1,155,471
	Australia	2,308	40,445
	Taipei	15	1,971
	China	1,060	36,857
	Denmark	12	2,911
	France	2,181	153,642
	Italy	200	3,849
	Japan	2,588	415,226
	Korea RP	6,000	29,746
	Netherlands	986	116,409
	Singapore	72	6,837
	USA	12,692	347,579
12099103	Onion	2,830	48,163
	Singapore	1,497	18,654
	South Africa	767	14,693
	USA	566	14,816
12099104	Pea	100	290
	USA	100	290
12099105	Radish	52,083	317,469
	Japan	17,358	95,885
	Korea RP	32,251	167,876
	Nepal	1,000	2,233
	Netherlands	134	19,893
	USA	1,340	31,581
12099107	Tomato	15,896	311,955
	Australia	80	1,355
	China	1,377	176,916
	France	51	1,851
	Hong Kong	50	7,861
	Israel	2	2,605
	Japan	10	2,875
	Korea RP	15	3,142
	Netherlands	14,098	51,651
	Thailand	3	787
	USA	210	62,912



12099109	Other Vegetable	484,695	6,069,298
	Australia	210	3,157
	Taipei	700	98,921
	China	13,428	358,989
	Denmark	22,878	239,004
	France	3,840	65,261
	Germany	3,828	43,865
	Iran	15	13,386
	Italy	6,434	24,410
	Japan	51,169	563,220
	Kenya	322	5,176
	Korea RP	39,621	1,723,625
	Netherlands	89,930	1,611,595
	New Zealand	1,000	8,646
	Pakistan	166,432	154,436
	Philippines	10	1,144
	Singapore	439	10,614
	Thailand	3,956	192,506
	USA	80,472	949,086
	Vietnam	11	2,259
12099901	Fruit	58,710	335,152
	China	3,004	107,273
	Denmark	40	6,213
	France	250	12,047
	Hong Kong	350	10,908
	Israel	400	6,707
	Japan	280	15,859
	Korea RP	350	14,780
	Netherlands	10,380	34,243
	Thailand	1,814	66,937
	UAE	19,870	7,952
	USA	21,972	52,235
12099909	Other	10,923	320,361
	Australia	16	4,153
	Denmark	4,841	50,080
	France	145	6,010
	Germany	200	4,096

	Japan	1,083	43,830
	Korea RP	425	25,581
	Netherlands	2,066	100,293
	Pakistan	200	470
	Switzerland	100	122
	Thailand	756	30,701
	UAE	150	176
	UK	150	1,017
	USA	791	53,833
	TOTAL	801,098	13,902,701

Source: Director General of Commercial Intelligence & Statistics.

**Table 2 - India: Seed Exports 2000/01 (Apr-Mar)**

		Quantity	Value
		Kg	\$
12091100	Sugar Beet	10000	14,854
	UAE	10000	14,854
12091900	Other beet	17,853	59,714
	France	2,140	21,801
	Germany	500	901
	Hong Kong	471	201
	Malaysia	10,300	19,987
	Philippines	1,150	4,203
	Singapore	2,000	1,759
	USA	1,292	10,860
12092200	Clover	600	327
	USA	600	327
12092300	Fescue	80	667
	Netherlands	80	667
12092900	Other forage	3,475,744	1,077,995
	Australia	250	4,020
	Bangladesh	1,721,000	627,280
	Channel Is.	144,000	33,218
	Taipei	1,404,000	318,315
	France	21,000	10,241
	Oman	2,300	3,185
	Pakistan	37,600	11,364
	Singapore	18,400	12,619
	South Africa	41,333	10,712
	Tajikistan	24,000	5,467
	UAE	33,861	23,636
	UK	10,000	5,316
	USA	18,000	12,622
12093000	Herbaceous plants	74,878	532,404
	France	2,143	18,202
	Germany	1,710	24,152

	Japan	3,300	63,077
	Jordan	5	272
	Malaysia	15,000	807
	Netherlands	11,258	111,256
	Philippines	17,900	9,873
	UAE	105	314
	UK	207	1,814
	USA	23,250	302,635
12099101	Cabbage	39,819	106,145
	Australia	56	1,682
	Bangladesh	10,000	12,671
	France	1,942	20,248
	Japan	10,000	35,842
	Kuwait	5	98
	Pakistan	14,000	27,274
	Sri Lanka	3,050	1,393
	Thailand	640	6,804
	Togo	126	132
12099102	Cauliflower	7,462	12,950
	Bangladesh	7,245	9,100
	Thailand	200	2,510
	Trinidad	17	1,340
12099103	Onion	548,333	353,323
	Belgium	15,000	15,521
	Canada	505	1,044
	Egypt	63,000	32,671
	Germany	14,760	18,380
	Japan	3,500	5,245
	Kenya	5,000	19,241
	Netherlands	129,570	116,677
	Sri Lanka	1,998	4,245
	Syria	210,000	100,212
	UAE	105,000	40,088
12099104	Peas	10,766	18,100
	Japan	5,866	12,951
	Maldives	500	595
	Singapore	4,400	4,555

12099106	Pomegranate	4,406	13,356
	Indonesia	106	231
	UAE	200	3,261
	USA	2,100	3,994
	Yemen	2,000	5,870
12099107	Tomato	68,997	2,425,501
	Bangladesh	198	30,598
	Belgium	8	1,742
	China	39	9,272
	France	20,213	445,949
	Italy	10,885	157,944
	Japan	1,061	39,236
	Netherlands	4,878	333,271
	Pakistan	412	47,617
	Philippines	18,000	13,678
	Singapore	10	560
	Thailand	36	3,579
	UK	524	78,821
	USA	12,733	1,263,235
12099109	Other Vegetable	2,255,463	4,156,409
	Australia	3,893	62,884
	Bahrain	508	5,190
	Bangladesh	274,038	380,568
	Canada	40	6,241
	China	1,000	1,094
	Denmark	2,750	9,732
	France	4,137	60,976
	Germany	281	913
	Ghana	102	1,287
	Indonesia	60,001	62,828
	Italy	45,539	328,659
	Japan	64,207	452,449
	Jordan	60,000	85,490
	Kenya	1,000	10,950
	Korea DP RP	500	3,014
	Korea RP	11,300	65,989
	Kuwait	950	7,494

	Malaysia	25	756
	Mauritius	265	8,243
	Mozambique	1	120
	Netherlands	78,764	143,025
	Oman	11,427	254,923
	Pakistan	933,686	612,857
	Philippines	135,261	138,273
	Qatar	1,195	10,273
	Saudi Arabia	136,668	113,052
	Singapore	183	4,988
	South Africa	1,040	3,459
	Spain	5	374
	Sri Lanka	2,900	8,648
	Switzerland	44,000	22,560
	Thailand	205,383	597,499
	UAE	78,400	57,655
	UK	145	6,698
	USA	92,869	603,825
	Yemen	3,000	23,424
12099901	Fruit	29,700	241,973
	Australia	202	2,984
	Bangladesh	190	9,913
	Taipei	900	10,802
	China	200	1,715
	France	1,515	21,055
	Germany	80	572
	Japan	2,000	12,554
	Mexico	113	2,223
	Oman	2,670	10,762
	Philippines	300	3,709
	Saudi Arabia	199	3,079
	Singapore	31	312
	Thailand	600	11,284
	UAE	2,000	4,245
	UK	4,000	5,025
	USA	14,700	141,738
12099909	Other	2,750,977	4,760,310

	Albania	140	2,905
	Argentina	3,165	9,880
	Australia	508	4,766
	Bahrain	75	1,023
	Bangladesh	435,489	403,756
	Cambodia	6	6
	Taipei	1,335,990	352,075
	China	56,112	31,656
	Denmark	489	3,587
	Djibouti	180	589
	Egypt	29,501	71,853
	El Salvador	540	69,011
	France	9,575	80,680
	Germany	9,087	118,199
	Hong Kong	3,024	21,153
	Iceland	71,760	364,144
	Indonesia	10	198
	Italy	49,556	633,283
	Japan	104,680	937,024
	Korea RP	246	27
	Kuwait	63	715
	Malaysia	265,542	629,205
	Maldives	66	352
	Myanmar	10	1,574
	Nepal	3,000	8,865
	Netherlands	22,953	159,697
	New Zealand	10	76
	Oman	3,166	22,716
	Pakistan	161,078	115,597
	Philippines	35,901	27,336
	Qatar	960	9,698
	Russia	5,629	8,576
	Saudi Arabia	46,878	33,052
	South Africa	100	1,985
	Spain	36	2,173
	Sri Lanka	14,000	4,829
	Syria	42,000	21,357

	Thailand	1,080	29,333
	Turkey	180	1,640
	UAE	10,104	20,578
	UK	2,408	241,425
	USA	25,680	313,716
	TOTAL	9,295,078	13,774,028

Source: Director General of Commercial Intelligence & Statistics